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(54) WATER-BASE BALLPOINT INK WITH METALLIC LUSTER

(57)Abstract:

PURPOSE: To obtain the title ink which gives a well-defined writing with metallic luster and has good long-term stability without deterioration even in long-term storage.

CONSTITUTION: The ink has a viscosity (measured with a type E viscometer at an ST rotor speed of 1rpm, at 25°C) of 10,000 to 150,000 and contains at least a pearlescent pigment preferably in an amount of 5-20wt.%, a water-soluble thickening resin comprising, e.g. a seed polysaccharide, such as guar gum or locust bean gum, its derivative or a microbial xanthan gum, a water-soluble organic solvent, such as glycol or glycerin preferably in an amount of 5-40wt.% and water.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] the ball-point with which, as for this invention, the hand of which golden and silver metallic luster color is obtained using a pearl pigment -- service water -- sex metallic luster color ink -- being related -- after a long term storage -- the hand of a metallic luster color -- it can obtain -- the ball-point with good ink regurgitation nature -- service water -- it is related with sex metallic luster color ink

[0002]

[Description of the Prior Art] In order to obtain the hand of which golden and conventionally silver metallic luster color, the ink which used an aluminium powder, bronze powder, and the pearl pigment as a pigment is proposed variously. For example, the double coloring ink constituent which it consists of a metal-powder pigment, an oil color, a resin, and solvents, such as an aluminium powder, and a color carries out a penetration diffusion around the hand formed by the metal-powder pigment, and produces the border-line effect is indicated by JP.62-37678.B. The metallic luster color ink for marking pens which becomes a JP.1-56109.B official report from a detailed metal powder, and a resin and solvents, such as an aluminium powder which carried out surface treatment, has the smooth ink defluxion nature from various marking pens, and has ***** at the time of practical use is indicated. Moreover, the ink which has the color of the oily metallic tone which does not contain the resin of the thickening nature of a fusibility and the water characterized by for a metal-powder pigment and a color pigment containing requirements every at least respectively further, and having the hyperviscosity beyond a necessary value in a solvent and the concerned solvent is indicated by JP.60-186573.A, and, as for this ink, the use to a pressurization ball-point is suitable for it.

[0003] Furthermore, the aqueous metallic ink which added the acetylene alcoholic derivative as an additive in a resin, aluminum paste, and the ink principal component that consists of water is indicated by JP.1-210478.A for the purpose of preventing the dirt of the application by the pinhole. Moreover, the water color ink using the stable pearl pigment is indicated to water instead of the metal-powder pigment at JP.5-117569.A.

[0004]

[Problem(s) to be Solved by the Invention] The aqueous metallic luster color ink which can be used as an object for ball-points is not proposed. It is required to be able to use as ink for ball-points, without re-distributing a pigment. Nevertheless, there was that [no] to which it is an aqueous and a pigment does not sediment in the ink by which the conventional proposal was made [above-mentioned]. For example, the ink indicated by JP.62-37678.B and JP.1-56109.B is oiliness, and, moreover, is conscious of the pen for markings. At the time of use, this pen for markings shakes a writing implement, churning members, such as a metal sphere, are held in the ink hold room, and the aluminium powder which sedimented is dispersedly used for it re-. That is, as for the ink constituent in these invention, an aluminium powder sediments for a short time. The ink indicated by JP.60-186573.A is oiliness although there is little sedimentation of a pigment. Moreover, although invention indicated by JP.1-210478.B and JP.5-117569.A is water color ink, it is conscious of the pen for markings like the above.

[0005] the ball-point which can be used good even if it saves the purpose of this invention for a long period of time -- service water -- it is in offering sex metallic luster color ink

[0006]

[Means for Solving the Problem] the ball-point whose viscosity of this invention is 10000-150000cps (ST Rota of E type viscometer, 1rpm, 25 degrees C), including a pearl pigment, the resin of thickening nature, a solvent, and water at least -- service water -- let sex metallic luster color ink be a summary

[0007] It explains to a detail below. The pearl pigment used for this invention is used as a coloring matter of a metallic luster color. A pearl pigment is obtained by covering the front face of a natural mica with the metallic oxides of a high refractive index, such as titanium oxide or an iron oxide. The mean particle diameter of a pearl pigment has a 5-60-micrometer desirable thing. If a mean particle diameter is 5 micrometers or less, pearl gloss will decrease, the metallic luster of a hand tends to decrease, and if it is 60 micrometers or more, when applying to the ball-point point currently generally used conventionally, the ink regurgitation tends to fall.

[0008] the pearl pigment marketed ***** -- Iriodin100 (mean-particle-diameter: -- 10-60 micrometers) ** and more than this 103 (10-50) below Silver, Iriodin300 (10-60), said -- there is [302 (5-20) and more than this 323 (5-20)] **** (Merck Japan make) etc. red, Iriodin502 (10-60 micrometers), and more than this 520 (5-20 micrometers) gold, Iriodin504 (10-60), and

more than this 524 (5-20) These have acid-proof and alkali resistance and are easily distributed to an insoluble water system but in water. A pearl pigment is used preferably five to 20% of the weight to the aqueous metallic luster color ink for ball-points.

[0009] The resin for thickening is used for the purpose, such as sedimentation prevention of a pearl pigment and the quality as an ink constituent for aqueous ball-points, for example, the ink transudation prevention from a nib, the fitness ink regurgitation, nib dirt, and **** prevention. As an object for ball-points used in the usual ambient atmosphere where the end of an ink hold spool is opened wide, the gar gum, the locust bean gum and its derivative of semen polysaccharide, the xanthan gum of a microorganism system, etc. can use it preferably. moreover -- making [many] the addition of the aforementioned resin for [suitable for a high-speed note or a nib facing up note] pressurization formula ball-points **** -- in addition, the tare of the carrageenan of seaweed polysaccharide, an alginic acid and its derivative, and resin polysaccharide -- gum ***** a cellulosic, a polyethylene oxide, a sodium polyacrylate of a synthetic macromolecule, etc. can be used Since it changes greatly with modalities of resin to use, the amount of the resin used for thickening is set up so that proper viscosity may be shown. The viscosity is 10000-150000cps (ST Rota of E type viscometer, 1rpm, 25 degrees C). Moreover, when using as an object for ball-points, it is desirable that the ratio of viscosity since the fall of the ink viscosity by the shearing force of ball rotation affected the ink flow rate from the nib, when it measures by 1rpm in ST Rota of E type viscometer and 25-degree C measurement conditions, and the measured value in 10rpm is 3.0 or more.

[0010] The water-soluble organic solvent is used for the purpose, such as the various qualities as water color ink for ball-points, for example, ink xeransis prevention with a nib, and ink anti-freeze in the time of low temperature, specifically independent in glycols, such as ethylene glycol, a diethylene glycol, a triethylene glycol, a propylene glycol, a polyethylene glycol, 1, 3-butylene glycol, a thiodiethylene glycol, and a glycerol, an ethylene glycol monomethyl ether, the diethylene-glycol monomethyl ether, 2-pyrrolidone, a triethanolamine, etc. -- or it can be mixed and used The amount used has 5 - 40 desirable % of the weight to the aqueous metallic luster color ink whole quantity for ball-points.

[0011] Water is used as a main solvent.

[0012] Except the above-mentioned component, further, when brewing various additives, such as a surfactant of rust-proofers, such as antiseptics, such as wetting agents, such as a urea, an ethylene urea, and thiourea, and lubricant, a benzothiazoline system, a ***** system, and a benzotriazol, an anion system, and a Nonion system, and the hue of the metallic luster color of the further various color, the color and the colored pigment called acid dye, basic dye, and direct dye can be used.

[0013] It faces manufacturing the metallic luster color ink for ball-points of this invention, and the various technique learned conventionally can be adopted. For example, each above-mentioned component is blended and it is easily obtained by carrying out churning mixture with agitators, such as a Henschel mixer, or carrying out mixed grinding by dispersers, such as a ball mill.

[0014]

[Function] About the aqueous metallic luster color ink for ball-points of this invention suppressing sedimentation of a pearl pigment also in a long-term store, and an effect being in a stability with the passage of time, it estimates as follows. Since viscosity is high, as for the ink constituent for the usual ball-points of this invention, a pearl pigment is fixed to the grade by which the fluidity of ink is not spoiled between resins, and as a result, sedimentation of a pearl pigment can be prevented. Moreover, to a resin, since insolubilization is not caused in part, a pearl pigment does not have gelation, hydrolysis, and that the viscosity of ink rises or decreases.

[0015]

[Example]

Example 1 Iridin302 (Merck Japan make) 10.0 weight section Jaguar CMHP (a gar gum derivative, Sansho Co., Ltd. make) 1.0 weight section Ethylene glycol 15.0 weight section Glycerol 10.0 weight section Water 62.9 weight section Pro ***** XL-2 (antiseptics, made in ICI Japan) 0.1 weight section NP-10 (a dispersant, made in Nikko Chemicals) Components other than 1.0 weight section above-mentioned each jaguar CMHP in a component were put in into the ball mill, after 10 hour distributed processing, jaguar CMHP was added, processing was performed again for 1 hour, and golden ink with a viscosity of 25000cps (E type viscometer, 1rpm, 25 degrees C) was obtained. When the ball-point (what consists of a transparent ink hold spool which consists of a hollow shaft cylinder made from polypropylene the nickel-silver ball-point chip (ball quality-of-the-material: cemented carbide) was connected [hollow shaft end]) was filled up with this golden ink and having been written down on space, the clear golden hand without a blot was obtained. Moreover, the viscosity ratio of 1/10rpm of this ink was 3.6.

[0016] Example 2 Iridin103 (Merck Japan make) 10.0 weight section Locust bean gum 2.0 weight section Propylene glycol 20.0 weight section Ethylene glycol 10.0 weight section Water 56.9 weight section Pro ***** GXL (antiseptics, made in ICI Japan) 0.1 weight section BT-12 (a dispersant, made in Nikko Chemicals) Distributed processing of 1.0 weight section above-mentioned each component was carried out in the ball mill for 12 hours, and silver ink with a viscosity of 35000cps (E type viscometer, 1rpm, 25 degrees C) was obtained. When the ball-point was filled up with this silver ink like the example 1 and having been written down on space, the clear silver hand without a blot was obtained. Moreover, the viscosity ratio of 1/10rpm of this ink was 3.1.

[0017] Example 3 Iridin524 (Merck Japan make) 10.0 weight section Xanthan gum 1.0 weight section Ethylene glycol 10.0 weight section Glycerol 10.0 weight section Water 67.9 weight section Pro ***** XL-2 0.1 weight section NP-10 Distributed processing of 1.0 weight section above-mentioned each component was carried out with the ball mill for 2 hours.

and the red ink of a metallic luster color with a viscosity of 30000cps (E type viscometer, 1rpm, 25 degrees C) was obtained. When the ball-point was filled up with this red ink like the example 1 and having been written down on space, the hand of the red of the clear metallic luster color without a blot was obtained. Moreover, the viscosity ratio of 1/10rpm of this ink was 6.0. [0018] Example 4 Iridin302 10.0 weight section Hydroxyethyl cellulose 5.0 weight section Ethylene glycol 17.0 weight section Glycerol 8.0 weight section Water 61.9 weight section Pro ***** GXL 0.1 weight section NP-10 Distributed processing of 1.0 weight section above-mentioned each component was carried out with the ball mill for 3 hours, and golden ink with a viscosity of 110000cps (E type viscometer, 1rpm, 25 degrees C) was obtained. After filling up with this golden ink a pressurization ball-point (what is the ink hold spool which consists of **** made from stainless steel which connected [end] the stainless steel ball-point chip (ball quality-of-the-material: cemented carbide), applies 2 the pressure of 3.0kg cm in this hold spool, and is sealed in a pallet), when it was written down on space, the clear golden hand without a blot was obtained. [0019] Jaguar CMHP of example of comparison 1 example 1 was reduced among 0.6 weight section, except only a part to have reduced having added water, it made like the example 1 and golden ink with a viscosity of 70000cps (E type viscometer, 1rpm, 25 degrees C) was obtained. When the ball-point was filled up with this golden ink like the example 1 and having been written down on space, the clear golden hand without a blot was obtained. Moreover, the viscosity ratio of 1/10rpm of this ink was 2.5.

[0020] Jaguar CMHP of example of comparison 2 example 1 was increased among 2.8 weight section, except only a part to have increased having reduced water, it made like the example 1 and golden ink with a viscosity of 180000cps (E type viscometer, 1rpm, 25 degrees C) was obtained. It has not written down, when the ball-point was filled up with this golden ink like the example 1 and having been written down on space. Moreover, the viscosity ratio of 1/10rpm of this ink was 5.0.

[0021] Instead of Iridin103 of example of comparison 3 example 2, except having used the aluminium powder (WB0230, product made from Oriental Aluminum), it made like the example 2 and silver ink with a viscosity of 36000cps (E type viscometer, 1rpm, 25 degrees C) was obtained. When the ball-point was filled up with this silver ink like the example 1 and having been written down on space, the clear silver hand without a blot was given. Moreover, the viscosity ratio of 1/10rpm of this ink was 3.2.

[0022] the ball-point obtained in examples 1-4 and the examples 1-3 of a comparison -- service water -- the viscosity change examination, the written examination, and the sedimentation test were performed about sex metallic luster color ink A result is shown in Table 1.

[0023]

[Table 1]

	粘度変化試験		筆記試験		沈降度試験
	直 後	経時後	直 後	経時後	
実施例 1	2 5 0	2 0 0	○	○	0/90
実施例 2	3 5 0	3 1 0	○	○	0/90
実施例 3	3 0 0	2 6 0	○	○	0/90
実施例 4	1 1 0 0	1 0 0 0	○	○	0/90
比較例 1	7 0	—	×	—	—
比較例 2	1 8 0 0	1 5 0 0	△	△	0/90
比較例 3	3 6 0	9 8	○	×	70/90

[0024] (Note of Table 1)

An example of comparison 1; viscosity change examination cannot be measured because of pearl-pigment sedimentation.

: A written examination cannot be measured because of pearl-pigment sedimentation at the time of a centrifugal degassing.

: A sedimentation test cannot be measured because of pearl-pigment sedimentation at the time of a centrifugal degassing.

[0025] Viscosity Change Examination: Measure the viscosity immediately after adjustment of ink and after the passage of time.

- A measurement condition: E type viscometer, 1rpm, 25 degrees C (unit poise).

- Put into screw **** made from with the passage of time condition: glass, and leave it for one month in a 50-degree C thermostatic chamber.

[0026] Written-examination: Observe the hand immediately after writing sample production, and the hand after the passage of time.

- The transparent ink hold spool which consists of a hollow shaft cylinder made from polypropylene the writing sample: ball-point chip was connected [hollow shaft end] was filled up directly [0.8g], and the centrifugal degassing of the

foam was carried out for the antisuckback field to the upper part after 0.1g restoration. However, the ink hold spool which consists of **** made from stainless steel which connected [end] the stainless steel ball-point chip (ball quality-of-the-material: cemented carbide) is filled up with 0.8g, and the ink obtained in the example 4 is 2 the pressure of 3.0kg/cm in a hold spool. It applied.

- Writing form: paper of fine quality (JIS 3201 note form A)

- Leave it for one month in the status of nib facing down in a with the passage of time condition: 50 degree C thermostatic chamber.

Evaluation O [... Writing impotentia [0027]] .. ** notes of can be taken good ... Blur occurrence x Degree Examination [of Sedimentation]: The transparent ink hold spool (passing inside 3.0mm) which consists of a hollow shaft cylinder made from - sample: polypropylene which measures the supernatant of the ink after the passage of time was filled up with 0.8g of ink.

- Leave it for one month in a with the passage of time condition: 50 degree C thermostatic chamber.

Evaluation The length of the length ink cylinder of a supernatant (unit mm)

[0028]

[Effect of the Invention] in the above, it explained in detail -- as -- the ball-point of this invention -- service water -- also with time, it is stable and sex metallic luster color ink is a useful thing which gives the hand of a clear metallic luster color and does not have ink transformation in a long-term store and which the desired end can fully attain

[Translation done.]